

## SOME REPLICABLE EXPERIMENTS OF LOK VIDNYAN SANGHATANA, MAHARASHTRA

These activities can be undertaken by any peoples Science Organization at a town or a district place.

### SCIENCE TRIPS-KNOW SCIENCE AND TECHNOLOGY IN YOUR TOWN

There are nearly 400 to 500 places in a city like Solapur (District headquarters in South Maharashtra) where you can take children or adults for science trips. Any city in India has more or less the same number of places. These are the places where science and technology are continuously being practiced. Examples, Railway Station—requires three days to see—types of railway lines, their constructions, platforms, signal systems, types of engines, types of carriages— (goods and passengers), loading and unloading of goods, communications systems, booking offices, canteens etc. etc. Similarly telephone exchange, post and telegraph office, radio—TV centre, water works, dams, canals and their constructions, water distribution, electrical centres, engineering colleges, polytechnics, hospitals, medical colleges and their departments and museums, road and bridge construction sites, buildings under construction, bus stand and their workshops, grain and vegetable markets all types of workshops and factories, agricultural research centres and their laboratories, farms, gardens, lakes, rivers in various seasons, a hill in various seasons, hotels and their kitchens, cinema halls auditorium and projection rooms. Circus coming to town (especially when the shows are not on) and so on newspaper and presses etc. etc.

### SIZE OF THE GROUP

There should be 15/20 children in one group and two adults activists volunteers. These children can be from one locality of, say a stone's throw radius. It can become a science club. On Saturday evening they can come together and discuss about the site to be visited on Sunday. If you are visiting Telephone Exchange a lecture on history and development of Telecommunication should be arranged. A local Telephone Exchange Engineer should be invited for it. If possible an exhibition of different models can be arranged. Generally the city exchange can arrange such an exhibition. History of the particular city exchange is very interesting. Everybody should take notes

## TRANSPORT

Generally special transport is not necessary. If needed the municipal authorities can give some concessions. The cost is not more than one rupee. Local auto-rikshaws, tempo drivers can be involved if their children are included in the trips.

## VOLUNTEERS

College students, boys and girls, housewives or any sympathiser. Generally there is no dearth of volunteers if their children are included in the trips. One notice on the college notice-board is sufficient. Some honorarium can be given to some students especially those who are staying in hostels.

## TOTAL NUMBER OF TRIPS

In a year from June to March 20 to 25 trips can be arranged. So in 5 to 6 years the children become well versed with the science and technology in the city. In each trip even 5/6 places can be visited.

## INVOLVEMENT OF PARENTS IN SCIENCE TEACHING

In any school time-table one can always find some periods meant for social work or work experiences or.....off periods. For any class one can find atleast 2 to 4 such periods in a week.

The school can invite some parents to teach during these periods. In other words they can adopt these periods—A railway engine driver having 15/20 years experience, a telephone operator, civil engineer, a plumber, a tinsmith, a mechanic, a black-smith, a welder, a weaver, a hotel cook, a projectionist from cinema hall, a factory worker, a nurse, a doctor, a printer, a farmer, a gardner, a photographer, a tailor, a barber, a cobbler, watch-maker, an elecrician, trader, hotel owners, a grounds man.....

A list of willing parents can be made by sending cyclostyled letters through the children and then a detailed time-table of one or two months can be easily made. Most of the time the parents are coming to the class rooms for the first time. They may not be good oraters. Their interviews with some practical demonstrations followed by questions and answers become extremely enjoyable. This activity brings parents very near to the schools.

This activity doesn't require money. Our experiences are quite delightful. Parents spend from their pockets and even they take leave from the offices and factories.



## SCIENCE CLUBS IN SCHOOLS CATALYSED BY OUT-SIDER SCIENCE ACTIVISTS

Generally science clubs are run by science teachers and they are supposed to be an activity of science teachers. Our experience is different. Science club activity should not be left to a science teacher alone. There should be an out-side science club volunteer visiting school regularly say once a week. He should be trained in various science hobbies like astronomy, model making, trekking, ham radio, aeromodelling, hobby workshops etc. etc. This out-sider is a very important catalyst. Generally a science teacher is a very busy staff member of a school. Generally overburdened. If out-side help is made available then he/she can work many times more efficiently in the science club.

The out-sider activist can be a part-timer, a college student or anybody. He/she can attend even four schools in a week. Some school authorities are ready to pay some honourarium also. He/she can collect lot of science education material and software like slide-shows, films, poster, exhibitions, toys and kits, telescopes, microscopes, mobile science and Museums arrange them for the school children. He/she can start very simple but important activities like writing science news and weather reports on the black-board, paper clippings etc.

After a successful pilot project of four or five schools in one year, special training courses can be arranged for more volunteers to start these activities in other schools. Further special one year courses may be started in some educational colleges.

### SCRAP BANKS AND R & D OF TOYS IN SCIENCE CLUBS

Shri Kontak, a science teacher from Miraj, district Sangli, (Maharashtra) started his scrap bank where he asked children to collect scrap from their homes, nearby cycle shops, factories, hospitals and so on. There was delightful response. The scrap bank has collected enough raw material to make toys and models. They have to purchase very little material from the market.

The scrap bank activity includes periodical collection of scrap selection cleaning, sorting and neatly storing the scrap such as nuts and bolts, nails, screws, wooden planks, rubber, leather, iron and aluminium sheets, plastic knobs, tubes, wheels, gears, bearings, glass tubes and bulbs, electronic parts, wires, ropes, thermocol packing, wooden and paper boxes scrap from old toys etc.

All types of prototypes and models can be prepared out of these scraps. A process of research and development of toys and models can be triggered through these activities.



## PICTURE BANK

Pictures from newspapers, magazines should be cut, sorted and neatly stored so that they are available to make colourful poster exhibitions. This activity must be started by every science centre.

## PARTICIPATION IN THE SOCIAL FESTIVALS LIKE GANESH UTSAV AND DURGA PUJA

Some branches of Lok Vidnyan Sanghatana started systematically participating in these social festivals by :

- i) giving programmes like slide shows, lectures, film shows, video shows etc.
- ii) decorating the pandals with science exhibitions, For example in the year of peace some pandals were having 'Hiroshima to Starwari' themes, showed with help of models and light & sound effects.
- iii) sale of toys

Preparation of these festivals can be started 3-4 months in advance. Appeals are circulated amongst the groups and mandals and detailed discussions are arranged with artists, electricians and science activists. Depending on the budgets, plans, blue prints and models are made.

After the successful experience of two years LVS is going to launch the all Maharashtra level programme of participating in such social festivals which are unnecessarily branded as religious festivals.

Experience of Solapur shows that because of this participation anti-sound pollution campaign during Ganesh Utsav could be launched with less resistance. Now is LVS invited for every city meeting of such festivals.

## PARTICIPATION IN FAIRS AND WEEKLY BAZARS

Last 6 years during Solapur—Siddheswar Yatra in January, lakhs of people have witnessed aeromodelling programmes and exhibitions on history and development of human flight. People have visited Lok Vidnyan stalls of toys and agricultural implements. LVS is now invited from various parts of the state.

Village fairs should be upgraded and made more meaningful and colourful by our active participation. Exhibition-cum-sale of science toys, slide shows, films, mobile planetarium, sky watching with the help of number of telescopes, kala jatha programmes etc. There are number of activities possible. There is an urgent need of such activities because these fairs are becoming more and more deteriorated and becoming vulgar also.

## SCIENCE WAVES

These are small and big waves when thousands and lakhs of people become curious about particular phenomena. Everybody thinks and talks about the phenomena. Pre planned organized efforts of science organizations can meet curiosity demands of the people and make the best use of such waves.

Eight years ago there was a wave created by skylab incident but there were no organizations to take advantage of that wave. But 16th February, 1980—the total Solar eclipse wave was captured. Activities were planned six months in advance. Surya Yatras were planned—Everything about the Sun—the solar system, astronomy, solar energy—exhibits were made in large numbers. Slide show lectures, films on astronomy, models of solar eclipse were mass produced. Besides these, large scale production of 1 rupee safe solar goggles were undertaken. They were sold in large number with pamphlets. There was tremendous response from the general public. We could reach lakhs of people by successfully riding the wave.

Same wave came at the time of Halleys Comet. We made best use of that wave also.

Sometimes we cannot plan well in advance but if the organizational network is ready then we can gear-up. Urgent meetings, preparation and mass production of simple software and distribution are possible.

## PRAYOG PARIWAR

### Brotherhood of Experimenters

On any first Saturday and Sunday of every month one can see 100/200 farmers gathered on their own in a community hall in Solapur. One can observe them listening with great interest to the lectures, carefully taking down notes in their notebooks. Participating in the discussions, exchanging notes and observations, coming to some conclusions, planning new experiments, evaluating the failures and successes. One can find them discussing in great details the different types of root systems of grapes, sugarcane or banana in different seasons at different soil depths. Physiology of each part of the plant as well as different experiments in irrigation packing, storing, processing, transport and marketing—every field of farming activities. All the farmers come voluntarily, spend own money for stay and food, pay fees to the visiting experts, plan and conduct experiments on their own farms at their own cost. No grant, no funding from government or outside agency is involved. They have even sent their representatives abroad to learn from the experiences in other countries.

Most of the farmers are small farmers from drought prone areas with very little irrigation facilities. They have very little or no formal education in agriculture but because of the Prayog



Pariwar they are harvesting bumper crops of 20 tonnes of seedless grapes per acre and they have developed their own varieties too. Because of the thorough understanding of plant physiology and continuous experimentation they have cut down the cost of irrigation, saved water and energy, reduced the pesticide and chemical fertilizer use without affecting the yields. Some farmers are now using only 15% of the chemical fertilizers previously used. They do not use pesticides bought ready-made from the market. They make their own formulations. The sales representatives of the Multinational Corporations even do not dare to claim false results for their products. Experts from the agricultural university do not visit these villages without studying or without enough home work. Engineers, Geologists think thrice before talking to these simple looking farmers.

The cost of Research & Development in Prayog Pariwar is just negligible as compared to the vast expenditure in the agricultural research institutions.

These farmers started Prayog Pariwar with crops like grapes and other cash crops because there is some assurance of returns. That is also because of co-operative marketing. Recently these farmers have taken up sugarcane on their priority list because of the co-operative sugar factory at Sol. Similarly they are interested in other crops and animal husbandry and sure of the success because they have mastered the difficult crop like grapes. This shows farmers can undertake R&D very effectively provided there is assurance in marketing and some justice. Because of Prayog Pariwar the quality of research in agricultural institutes nearby is improving. Young students in agricultural colleges are inspired to take their study seriously.

## LARGE SCALE OF PEOPLE IN THE STUDY OF NATURAL RESOURCES

### STUDY OF WELLS

During 1983-84 Marathi Vidnyan Parishad, Udgir Branch, District Latur in Marathwada region of Maharashtra undertook survey of 200 wells in the water-shed of a minor river. This is a drought prone area. The study was undertaken with the help of commerce college students staying in hostels. Majority of the students were from the nearby rural areas. The study was in their own interest. A training camp of three days was organized and detailed questionnaire was prepared. Students worked on Sundays and in their holidays.



This study triggered many similar projects. Lok Vidnyan Sanghatana took up projects in the drought prone Verala, sub-basin of Krishna basin, Detailed study of 1000 wells was taken up with help of farmers, social activists and students during the Vidnyan Yatra of 1985, in which the main subject was water. After this detailed study of the basin a detailed report was prepared. A big 'Pani Parishad' was organized in which the alternative plan of Yerala basin was published in the form of a book 'Assood' (Whip). Peoples demands were formulated on the basis of the technical possibilities. Peoples movement was built up. Further people of two villages took up a minor irrigation project called as 'Baliraja Dharam Yojna' (Farmers Dam) on their own. With the help of consultants low cost techniques were used. College students and farmers worked together for one month. Then there was a stay order from the District Collector. There was a big agitation by the students and the farmers on this issue. Finally government allowed the dam to be built. After the completion the water will be distributed equitably. Cropping plans will be according to the 'Pani Parishad'. The whole process was started by the study of wells.

#### PROJECTS BHAGEERATH 1987-92

Because of the success of these projects now LVS and other organizations have jointly planned for a very ambitious project called as 'Project Bhageerath'. It is a five years project of studying water management by seeking participation of nearly 15,000 watersheds in the four main basins - of Tapi, Godavari, Krishna & Konkan. A committee of 10 volunteers in each watershed will be formed. All educational institutions in these watershed will be involved. The project demands commitment of 60 days/year from each volunteer-some Sundays and mid-term and summer holidays. Out of these 60 days, 15 days will be training of the volunteers. It is going to be the largest training programme in water and land management. Preliminary meetings, touring is over. This massive scale participation of youths in studying natural resources like water will bring out a detailed study of 1500 watersheds thousands of percolation tanks, hundreds of minor and medium projects and some of the major projects. Similarly 2 lakh wells will be studied in details. Agro climatic conditions like weather, soils, rocks, cropping patterns, vegetation, pastures, forests will be studied. Interviews of thousands of farmers especially old farmers will be recorded. Similarly thousands of artisans will be interviewed. People who migrated to the cities during droughts from 1947 will be interviewed. Rural industrialization will be studied in details.



## PRODUCTION, DISTRIBUTION AND SALES CENTRES OF SCIENTIFIC TOYS

During the Bharat Jan Vigyan Jatha everybody in the central executive committee, state organizing committees and the local committees is convinced about the important role of the science software especially toys and kits. Unfortunately the budget for the toys was too meagre as compared to the need. Further there was a delay in selection of toys and paying advances to the manufacturers. There were lot of difficulties in supply and distribution of the toys. No time was left for training. Still then there is a large demand created because of the jatha activities. Future of such activities is bright. Because of the BJVJ large network is now created which was simply not in existence. Even some professional marketing organizations do not dream of such a network.

According to our experience sky is the limit to select, to produce and further R&D of new scientific toys and kits. Every local committee of the jatha can take up the activity of a science toy shop. In the beginning they can start with the distribution and sale of already available toys then slowly start local level or state level manufacturing activity. Most of the toys and kits can be manufactured at most of the district places. Same case is with the other software. Even further modifications, research and development can be undertaken at any district place or town where number of experienced persons are available. They can be involved in such activities.

## TOYS AND SOFTWARE LIBRARIES

Some toys and kits and instruments like telescope as wells as some software are costly. A library can be established at a district place or at a zonal place from where the toys, kits and software will be available on loan and by paying reasonable charges. Schools, science clubs, science centres can become members of such library. These activities definitely make the local science organizations self-reliant financially.

Generally the manufacturers and suppliers give 20-25% discount. If the manufacturing is undertaken by the organizations then the costs can be increased substantially.

List of some toys and kits, their manufacturers and suppliers with the price list is given in appendix.

Let us start a new culture of science toys. It is a struggle against the profit oriented costly toys with a very little or no scope for creativity. There is an aggression of toy machine guns, speed cars and dolls.